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## SCIENTIFIC APPROACH FOR PLAYING SPORTING GAMES IN MODERN ERA: ACHIEVING TRUE SPORT

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### ABSTRACT

A healthy nation is always a wealthy nation. Physical exertion has long been part of human evolution; take that away and you have an imbalance. Therefore, it is necessary to put emphasis on sports. One can think of a healthy mind only in a healthy body. Daniel Lieberman presented some stark figures on India's impending healthcare crisis. He quoted studies that showed moderate exercise<sup>1</sup> (30 minutes a day, five days a week) had led to a 40 percent decrease in heart disease; 27 percent decrease in stroke; and 50 percent decrease in diabetes, cancer and blood pressure. More medicine surely wasn't the answer to more disease.

Science in sports is involved not only in training for performance but the equipment and apparels also. Each and every armour of sportspersons has specific dimensions & standards and are scientifically designed to improve the performance in sports. They exist as a result of serious work carried out over a long period by sports scientists. From shoes to helmet, every equipment a sportsperson uses, is aerodynamically and biomechanically tested.

**Keywords:** *Sports, Sports Science, Sports Training, Principles of Sports Training, Sports technology.*

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### I. INTRODUCTION

The modern Olympic movement brought recognition to the cultural and social functions of sports. Sports once again became a respectable activity and several popular sports acquired organizational infrastructure at national and international level. Sports training also gained strength from the modern Olympic movement and it acquired the status of an important science in the beginning of the present century. Science of sports training as an independent sports science discipline is hardly 30 years old.

Performance sports aim at high sports performances and for that the Physical and psychic capacities of sportsmen are developed to extreme limits. This normally does not happen in other areas of human activity. As a result, performance sports yield valuable knowledge about the limits to which human performance and various performance factors can be developed. It also leads to discovery of scientific means and methods for improving various physical and psychic capacities (performance factors) to exceptionally high levels. This knowledge can be fruitfully applied to other areas of sports and human activity.

Sport is the medium through which an individual and nation can get name and fame<sup>2</sup>. Sport plays an important role in our lives and our society. There are various health benefits for those who are involved in active sports and maintain active daily lifestyles. Beyond the physical benefits, sport brings emotional, psychological, and social benefits, as the athlete learns and experiences self-discipline, the joys of achievement, and the lessons of losing. Sport can even achieve social change through the common language of play by bringing people together even in places and times of conflict<sup>3</sup>.

Sports, which evolved as a set of survival activities like hunting or training for war has now become a million-dollar affair. In present scenario every sportsman wants to win at any cost. The temptation of winning, fame, and notoriety stretches its grasp from the world of professional sports to school playground. The indicators of a society that aims to win at all costs are plentiful; early specialization, overtraining, overzealous parents, intolerant coaches and athletes. In this era of throat cutting competition, performance of sportspersons has long been the interest of scientists which led to the evolution of sports science.

Sports performance is undoubtedly multi-disciplinary and highly scientific in nature. Usain Bolt's record run, Tiger Wood's stroke and Yuvraj Singh's sixer streak are indeed exemplary and not less than some rocket science. The performance in sporting events is a complex of physical, physiological, psychological, biomechanical, nutritional and immunological aspects. Hence The sports training, which is a process of blending together these factors in the right mix at the right time and in the right amount, turns out to be even more complex and scientific in nature. From selection of individual in a sport until his performance in competitive sports, each and every phase is highly scientific in nature. To fulfil these demands, several disciplines of sports science are required to work in a coordinated manner.

A very powerful impetus for the development of Sports Training came from the performance sports. The process of preparing athletes for winning world level competitions led to the emergence of a new stream in sports i.e. sports science. In the last few decades several disciplines of sports science have been established e.g., sports medicine, sports physiology, sports training, sports bio-mechanics, sports psychology, sports pedagogy, sports nutrition and so on. The sports science is still in its state of infancy and in the near future more sports science disciplines are likely to emerge. Some of these disciplines have already emerged, e.g., sports statistics, sports biochemistry, sports neuro-physiology, sports cybernetics etc. In order to yield the maximum potential performance in competition sports, these sports sciences have to be involved in each and every phase in the making of a sports person.

## II. SCIENTIFIC BASES OF SPORTS AT VARIOUS STAGES OF SPORTS TRAINING PROCESS

The scientific bases of modern sports training are formed by:

1. **Assessment of Biological capacities and Anthropometry** is carried out at the very first stage i.e. Talent Identification, in order to measure the degree of suitability of individual for a particular activity, sports or event. In this phase of sports training, several scientific means and methods are employed to assess anthropometric and biological variables such as- Suture, Limb girth, muscle fibers ratio, aerobic and anaerobic capacities etc.
2. **Fitness training and Condition** is a primary prerequisite, on which the performance of sportspersons depend up to a great extent. The sports related fitness is a combination of five components i.e. Strength, Endurance, Speed, Flexibility and Coordinative abilities. Fitness training in itself is a very complex process as different sporting events require different level of fitness and condition. Different components require different training methods to improve. Every component has specific methods of training designed to improve that particular component of fitness. Resistance training for strength, Fartlek training for endurance, interval training for speed, PNF for flexibility and Combination training for coordinative abilities are some examples of training methods meant for improvement of components of fitness.
3. **Scientific Principles of Sports Training** are the guidelines for coaches, teachers and sportspersons for formulation, implementation and control of sports training. These principles are applied throughout the whole process of training of sportspersons, as a way to govern the whole process systematically. These principles are- Progression of load, Uniformity and differentiation, Progressive specialization, Cyclicity etc. These principles help avoiding unnecessary carryover of fatigue, prevent wear and tear to athlete and reduces the risks of injury, thereby ensures the maximum results from training.
4. **Specific Principles governing the acquisition of sports skills** for each sports discipline, in particular each of the events. These are various biomechanical and kinesiological principles specific to the various skills of particular event or sports, that ensure an improvement of performance and determine the rational variation of content and organization of training process over the years. These principles are intended to strive for the maximum output on the cost of the minimum input. Some of them are Aerodynamics (lift and drag), projectile, principles of lever etc.

5. **Sports specific applications of technology in the area of equipment** paved its way in twentieth century in order to help achieving the intended purpose i.e. improved performance. Application of scientific methods in sports has resulted in some real changes in terms of athletes' comfort, spectators' comfort and officials' comfort. Earlier, in absence of technology the athletes in ancient Olympics used to participate naked, equipment too was 'off the rack' and the judgments were also subjective, on the contrary every equipment today is designed scientifically even the personal gears such as shoes and clothing. Streamlined suits for swimmers, athletes and bicyclists are some examples of use of science in apparels of athletes. Scientific application has also made judging and compiling results more accurately and objectively. Technologies such as 360-degree camera inside football, Photo finishing devices, in-stadium display, e-scoreboards etc. has aided officials to precisely judge the competition as well as spectators to enjoy the first-hand experience of the performances.
  
6. **Sports Medicine**, also known as sports and exercise medicine, is one of the sports sciences. Injuries are nothing less than a part and parcel of sports. The sports medicine comes into play when an injury is sustained by player or athlete. Sports injuries may occur due to variety of factors such as overtraining, lack of concentration, collision, improper technique or equipment etc. With the time sports medicine has also developed and broadened its scope. Its not limited to sports injuries only rather it covers sports nutrition, pediatrics, women health etc. Not only treatment but injury prevention and rehabilitation of injured sportsperson are also very important aspects of sports medicine. Many miracles have already been done by medical science in field of sports.

### III. CONCLUSION

Sports, nowadays, is not just a recreational activity. The values of modern sports itself have changed as compared to traditional ones. It has now become an aid to bring people together, nations together. It also helps in raising a country's economy. The impact of sports is so peculiar that every country has specific policies and provisions for development and improvement of sports. It has a huge impact on community health and productivity. Modern age is the age of science and sports has long been an area of interest for the scientists, whose efforts have helped manifesting it as a highly scientific activity. Sports have developed quite a lot in last few decades, various innovative developments have been seen in the equipment, apparel, playfield, training etc. A lot of researches have been done in the field of sports and physical education which is the only reason why sports science could develop and establish itself. Though number of researches done in this field is not enough, especially in our country the quality of research in sports has not been up to the mark. If our country has to develop as a sporting nation, the quality of research in sports sciences has to be improved because every aspect of sports is scientific and we cannot afford to be on the backseat. The results of researches can be applied to develop scientific temper in the coaches and athletes from the grass root level which will help producing good athletes and great coaches. We cannot think of Olympic level performances without this. More scientific researches and innovations in this field should be encouraged to boost the performance, increase participation and promoting vitality & health through sports.

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